

Amendments to the Claims:

This listing of claims will replace all prior listings of claims in the application.

Listing Of Claims:

Claim 1. (currently amended): An illumination apparatus comprising:

an inner-surface reflecting type integrator;

an optical system for directing a beam from a light source to a portion of incidence of said inner-surface reflecting type integrator;

an wave-front splitting type integrator;

an image-forming optical system for arranging ~~the~~ a portion of ~~incidence~~ exit of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of said wave-front splitting type integrator, and for directing a beam from ~~said beam-mixer~~ said inner-surface reflecting type integrator to said wave-front splitting type integrator; and

an irradiating optical system for superimposing multiple beams from said wave-front splitting type integrator on a plane to be irradiated,

wherein a stop is provided at or near the portion of exit of said inner-surface reflecting type integrator.

Claim 2. (original): An illumination apparatus according to claim 1, wherein said inner-surface reflecting optical integrator reflects at least a part of incident light with an internal surface of said inner-surface reflecting optical integrator, and for forming a surface light source on or near the plane of exit of said inner-surface reflecting optical integrator.

Claim 3. (original): An illumination apparatus according to claim 1, wherein said wave-front splitting type integrator is a lens array for splitting a wave front of incident light, and

for forming multiple secondary light sources on or near the portion of exit of said wave-front splitting type integrator.

Claim 4. (original): An illumination apparatus according to claim 1, wherein said stop is a mechanical aperture stop.

Claim 5. (original): An illumination apparatus according to claim 1, wherein said stop is made of a light shielding material applied onto the portion of exit of said inner-surface reflecting type integrator.

Claim 6. (original): An illumination apparatus according to claim 1, wherein said stop is made of a multi-layer film vapor-deposited onto the portion of exit of said inner-surface reflecting type integrator.

Claim 7. (original): An illumination apparatus according to claim 1, wherein said stop is made of a metallic film vapor-deposited onto the portion of exit of said inner-surface reflecting type integrator.

Claim 8. (previously presented): An illumination apparatus according to claim 1, wherein said image-forming system is a zoom optical system.

Claim 9. (previously presented): An illumination apparatus according to claim 1, wherein the portion of exit of said inner-surface reflecting type integrator has a polygonal shape, and said stop has an aperture for correcting σ anisotropy.

Claim 10. (original): An illumination apparatus according to claim 9, wherein said stop has an approximately circular aperture.

Claim 11. (canceled),

Claim 12. (currently amended): An illumination apparatus comprising;

an inner-surface reflecting type integrator including a portion of exit with an n-gonal shape where n is a natural number;

a wave-front splitting type integrator;

a zoom optical system for arranging a portion of exit of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of said wave-front splitting type integrator, and for projecting an image of the portion of exit of said inner-surface reflecting type integrator[[,]] onto [[a]] the portion of incidence of said wave-front splitting integrator; and

an irradiating optical system for superimposing multiple beams from said wave-front splitting integrator on a plane to be irradiated,

wherein a stop having an approximately circular aperture is provided at or near the portion of exit of said inner-surface reflecting type integrator.

Claim 13. (canceled).

Claim 14. (currently amended). A projection exposure apparatus comprising:

an illumination apparatus for illuminating a mask located on a plane to be illuminated;

and

a projection optical system for projecting a pattern on said mask onto a wafer,

wherein said illumination apparatus comprising:

an inner-surface reflecting type integrator;

an optical system for directing a beam from a light source to a portion of incidence of said inner-surface reflecting type integrator;

[[an]] a wave-front splitting type integrator;

an image-forming optical system for arranging [[the]] a portion of ~~incidence~~ exit of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of

said wave-front splitting type integrator, and for directing a beam from ~~said beam-mixer~~ said inner-surface reflecting type integrator to said wave-front splitting type integrator; and

an irradiating optical system for superimposing multiple beams from said wave-front splitting type integrator on a plane to be irradiated,

wherein a stop is provided at or near the portion of exit of said inner-surface reflecting type integrator.

Claim 15. (currently amended): A projection exposure apparatus comprising:

an illumination apparatus for illuminating a mask located on a portion to be illuminated;

and

a projection optical system for projecting a pattern on said mask onto a wafer,

wherein said illumination apparatus comprising:

an inner-surface reflecting type integrator including a portion of exit with an n-gonal shape where n is a natural number;

a wave-front splitting type integrator;

a zoom optical system for arranging a portion of exit of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of said wave-front splitting type integrator, and for projecting an image of the portion of exit of said inner-surface reflecting type integrator[[,]] onto [[a]] the portion of incidence of said wave-front splitting integrator; and

an irradiating optical system for superimposing multiple beams from said wave-front splitting integrator on a plane to be irradiated, wherein a stop having an approximately circular aperture is provided at or near the portion of exit of said inner-surface reflecting type integrator.

Claim 16. (canceled):

Claim 17. (currently amended): A device fabrication method comprising the steps of:

projecting a pattern on a mask onto a wafer by using a projection exposure apparatus; and
developing said wafer to which said pattern was transferred,

wherein said projection exposure apparatus comprising:

an illumination apparatus for illuminating a mask located on a plane to be illuminated;

and

a projection optical system for projecting a pattern on said mask onto a wafer,

wherein said illumination apparatus comprising:

an inner-surface reflecting type integrator;

an optical system for directing a beam from a light source to ~~the portion of incidence~~ the portion of incidence
exit of said inner-surface reflecting type integrator;

an wave-front splitting type integrator;

an image-forming optical system for arranging the portion of incidence of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of said wave-front splitting type integrator, and for directing a beam from ~~said beam mixer~~ said inner-surface reflecting type integrator to said wave-front splitting type integrator; and

an irradiating optical system for superimposing multiple beams from said wave-front splitting type integrator on a plane to be irradiated, wherein a stop is provided at or near the portion of exit of said inner-surface reflecting type integrator.

Claim 18. (currently amended): A device fabrication method comprising the steps of:

projecting a pattern on a mask onto a wafer by using a projection exposure apparatus; and

developing said wafer to which said pattern was transferred,
wherein said projection exposure apparatus comprising:
an illumination apparatus for illuminating a mask located on a plane to be illuminated;
and
a projection optical system for projecting a pattern on said mask onto a wafer,
wherein said illumination apparatus comprising:
an inner-surface reflecting type integrator including a portion of exit with an n-gonal
shape where n is a natural number;
a wave-front splitting type integrator;
a zoom optical system for arranging a portion of exit of said inner-surface reflecting type
integrator approximately conjugate with a portion of incidence of said wave-front splitting type
integrator, and for projecting an image of the portion of exit of said inner-surface reflecting type
integrator[[,]] onto [[a]] the portion of incidence of said wave-front splitting integrator; and
an irradiating optical system for superimposing multiple beams from said wave-front
splitting integrator on a plane to be irradiated, wherein a stop having an approximately circular
aperture is provided at or near the portion of exit of said inner-surface reflecting type integrator.

Claim 19. (canceled).